

WHAT IS CLAIMED IS:

1. A GaN light emitting diode comprising:

5 a first conductive GaN clad layer with an upper surface provided with a first contact formed thereon;

an active layer formed on a lower surface of the first conductive GaN clad layer;

a second conductive GaN clad layer formed on a lower surface of the active layer;

10 a conductive adhesive layer formed on the second conductive GaN clad layer; and

a conductive substrate, with a lower surface provided with a second contact formed thereon, formed on a lower surface of the conductive adhesive layer.

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2. The GaN light emitting diode as set forth in claim 1, further comprising a reflective layer made of a conductive material and formed between the second conductive GaN clad layer and the conductive adhesive layer.

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3. The GaN light emitting diode as set forth in claim 2, wherein the reflective layer is made of a material selected from the group consisting of Au, Ni, Ag, Al and their alloys.

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4. The GaN light emitting diode as set forth in claim 1, wherein the conductive substrate is made of a material

selected from the group consisting of silicon (Si), germanium (Ge) and GaAs.

5 5. The GaN light emitting diode as set forth in claim 1,
 wherein the conductive adhesive layer is made of a
material selected from the group consisting of Au-Sn, Sn, In,
Au-Ag and Pb-Sn.

10 6. The GaN light emitting diode as set forth in claim 1,
 wherein the first conductive GaN clad layer is a GaN
crystalline layer doped with an n-type impurity, and the
second conductive GaN clad layer is a GaN crystalline layer
doped with a p-type impurity.

15 7. A method for manufacturing GaN light emitting diodes,
comprising the steps of:

 (a) forming a light emitting structure on a sapphire
substrate, said light emitting structure including a first
conductive GaN clad layer, an active layer and a second
20 conductive GaN clad layer sequentially stacked on the sapphire
substrate;

 (b) cutting the light emitting structure into plural
units so that each of the unit light emitting structures has a
designated size;

25 (c) attaching a conductive substrate to exposed upper
surfaces of the unit light emitting structures using a
conductive adhesive layer;

(d) removing the sapphire substrate from the unit light emitting structures;

(e) forming first and second contacts respectively on the surface of the first conductive clad layer, from which the sapphire substrate is removed, and the exposed surface of the conductive substrate; and

(f) cutting the resulting structure provided with the first and second contacts into plural unit light emitting diodes.

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8. The method for manufacturing GaN light emitting diodes as set forth in claim 7,

further comprising the step of (h) forming a reflective layer made of a conductive material on the second conductive GaN clad layer.

9. The method for manufacturing GaN light emitting diodes as set forth in claim 8,

wherein the reflective layer is made of a material selected from the group consisting of Au, Ni, Ag, Al and their alloys.

10. The method for manufacturing GaN light emitting diodes as set forth in claim 7,

wherein the step (c) includes the sub-steps of:

(c-1) forming the conductive adhesive layer on the lower surface of the conductive substrate; and

(c-2) attaching the lower surface of the conductive substrate provided with the conductive adhesive layer to the exposed upper surfaces of the unit light emitting structures.

5 11. The method for manufacturing GaN light emitting diodes as set forth in claim 7,

 wherein the step (c) includes the sub-steps of:

 (c') forming the conductive adhesive layer on the exposed upper surfaces of the unit light emitting structures;

10 and

 (c'') attaching the conductive substrate to the upper surfaces of the unit light emitting structures provided with the conductive adhesive layer.

15 12. The method for manufacturing GaN light emitting diodes as set forth in claim 7,

 wherein in the step (d) the sapphire substrate is removed from the unit light emitting structures by irradiating a laser beam on the lower surface of the sapphire substrate.

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 13. The method for manufacturing GaN light emitting diodes as set forth in claim 12,

 wherein the size of each of the cut unit light emitting structures is approximately the same as or smaller than the
25 area of the irradiation of the laser beam.

 14. The method for manufacturing GaN light emitting

diodes as set forth in claim 12, wherein:

the size of each of the cut unit light emitting structures is approximately the same as or smaller than that of each of the cut unit light emitting diodes; and

5 in the step (f) the conductive substrate is cut into plural units with a designated size corresponding to the size of each of the unit light emitting diodes.

15 15. The method for manufacturing GaN light emitting diodes as set forth in claim 7,

wherein the conductive substrate is made of a material selected from the group consisting of silicon (Si), germanium (Ge) and GaAs.

15 16. The method for manufacturing GaN light emitting diodes as set forth in claim 7,

wherein the conductive adhesive layer is made of a material selected from the group consisting of Au-Sn, Sn, In, Au-Ag and Pb-Sn.

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17. The method for manufacturing GaN light emitting diodes as set forth in claim 7,

wherein the first conductive GaN clad layer is a GaN crystalline layer doped with an n-type impurity, and the
25 second conductive GaN clad layer is a GaN crystalline layer doped with a p-type impurity.